

WHAT IS CLAIMED IS:

1 1. A system for delivering a guide wire to an artery and a side branch vessel of
2 the artery, the system comprising:
3 a catheter defining a first lumen with a first opening and a second lumen with a
4 second opening;
5 a first guide wire configured to extend through the first lumen; and
6 a second guide wire configured to extend through the second lumen,
7 wherein the first opening is configured to direct the first guide wire into the side
8 branch vessel, and the second opening is configured to direct the second guide wire into the
9 artery.

1 2. The system of claim 1, wherein the catheter further comprises a radiopaque
2 indicator adjacent to the first opening.

1 3. The system of claim 2, wherein the radiopaque indicator comprises at least
2 one stud attached to the shaft.

1 4. The system of claim 2, wherein the radiopaque indicator comprises a ring that
2 encircles at least a part of the circumference of the shaft.

1 5. The system of claim 4, wherein the ring includes an opening and the opening
2 is adjacent to the first opening in the shaft.

1 6. The system of claim 4, wherein the ring includes an opening and the opening
2 is coaxial with the first opening in the shaft.

1 7. The system of claim 4, wherein the ring includes an extension and the
2 extension projects into the first opening in the shaft.

1 8. The system of claim 4, wherein the ring comprises a pair of bands that are
2 joined at a first point of the circumference of the bands and are separated at a second point of
3 the circumference of the bands, and the first opening is positioned between a separation at the
4 second point of the pair of bands.

1 9. The system of claim 4, wherein the ring includes a cut-out section.

1 10. The system of claim 1, wherein the catheter comprises a first section including
2 the first lumen and the second lumen and extending between the first end and the first
3 opening, and a second section including the second lumen and extending between the first
4 opening and the second end, and the second section has a smaller cross-section than a cross-
5 section of the first section.

1 11. The system of claim 10, wherein the catheter includes an aimer positioned at
2 least in part on the second section in a position that is adjacent to the first section.

1 12. The system of claim 11, wherein the aimer includes a surface that is
2 configured to direct the guide wire in the first lumen in a direction away from the catheter
3 when the guide wire passes through the first opening.

1 13. The system of claim 1, wherein the catheter includes an inflatable balloon
2 positioned on the catheter adjacent to the first opening, whereby a guide wire passing through
3 the first opening is deflected by the balloon.

1 14. The system of claim 1, further comprising at least one balloon inflation
2 catheter configured to be delivered over one of the guide wires.

1 15. A delivery catheter configured to deliver a first guide wire to an artery and a
2 second guide wire to a side branch vessel of the artery, the delivery catheter comprising:
3 a shaft having a first end and a second end;
4 a first lumen in the shaft passing to a first opening in the shaft; and

5 a second lumen passing to a second opening in the shaft.

1 16. The delivery catheter of claim 15, wherein the catheter further comprises a
2 radiopaque indicator attached to the shaft at a location adjacent to the first opening.

1 17. The delivery catheter of claim 16, wherein the radiopaque indicator comprises
2 at least one stud attached to the shaft.

1 18. The delivery catheter of claim 16, wherein the radiopaque indicator comprises
2 a ring that encircles at least a part of the circumference of the shaft.

1 19. The delivery catheter of claim 18, wherein the ring includes an opening and
2 the opening is adjacent to the first opening in the shaft.

1 20. The delivery catheter of claim 18, wherein the ring includes an opening and
2 the opening is coaxial with the first opening in the shaft.

1 21. The delivery catheter of claim 18, wherein the ring includes an extension and
2 the extension projects into the first opening in the shaft.

1 22. The delivery catheter of claim 18, wherein the ring comprises a pair of bands
2 that are joined at a first point of the circumference of the bands and are separated at a second
3 point of the circumference of the bands, and the first opening is positioned between
4 separation at the second point of the pair of bands.

1 23. The delivery catheter of claim 18, wherein the ring includes a cut-out section.

1 24. The delivery catheter of claim 15, wherein the shaft comprises a first section
2 including the first lumen and the second lumen and extending between the first end and the
3 first opening, and a second section including the second lumen and extending between the

4 first opening and the second end, and the second section has a smaller cross-section than a
5 cross-section of the first section.

1 25. The delivery catheter of claim 24, wherein the catheter includes an aimer
2 positioned at least in part on the second section in a position that is adjacent to the first
3 section.

1 26. The delivery catheter of claim 25, wherein the aimer includes a surface that is
2 configured to direct the guide wire in the first lumen in a direction away from the catheter
3 when the guide wire passes through the first opening.

1 27. The delivery catheter of claim 15, wherein the catheter includes an inflatable
2 balloon positioned on the catheter adjacent to the first opening, whereby a guide wire passing
3 through the first opening is deflected by the balloon.

1 28. A method of catheterizing an artery and a side branch of the artery, the
2 method comprising:

3 providing a side branch delivery catheter comprising a shaft having a first end and a
4 second end, a first lumen in the shaft passing to a first opening in the shaft, and a second
5 lumen passing to a second opening in the shaft;

6 inserting the delivery catheter into the vasculature;

7 advancing the delivery catheter into an artery;

8 positioning the first opening adjacent to the side branch of the artery;

9 inserting a first guide wire into the opening in the hub and advancing the guide wire
10 into the first lumen;

11 inserting a second guide wire into the opening in the hub and advancing the guide
12 wire into the second lumen; and

13 advancing the first guide wire through the first opening and into the side branch of the
14 artery.

1 29. The method of claim 28, further comprising advancing the second guide wire
2 through the second opening and into the artery.

1 30. The method of claim 28, further comprising:
2 providing an inflatable balloon catheter having an inflatable balloon;
3 advancing the inflatable balloon catheter over the first guide wire; and
4 deploying the inflatable balloon in the side branch of the artery.

1 31. The method of claim 28, further comprising:
2 providing an inflatable balloon catheter having an inflatable balloon;
3 advancing the inflatable balloon catheter over the second guide wire; and
4 deploying the inflatable balloon in the artery.

1 32. The method of claim 28, wherein positioning the first opening adjacent to the
2 side branch of the artery comprises viewing a radiopaque indicator mounted on the catheter
3 under fluoroscopy to orient the indicator relative to the side branch of the artery.